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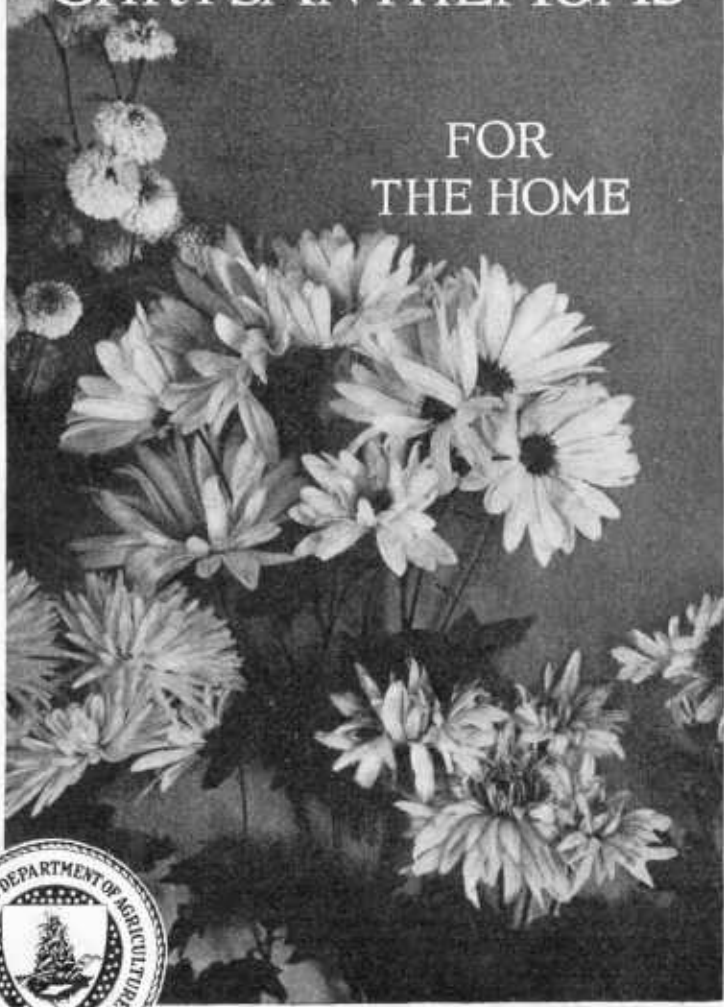
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# U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1311

## CHRYSANTHEMUMS

FOR  
THE HOME



**A**MONG HARDY PERENNIALS used for the decoration of yards and gardens some few families stand out above their fellows, so that they form the backbone of any scheme of herbaceous planting. The identity of these plants of prime importance varies somewhat with the geographical situation.

Chrysanthemums are of little value as hardy plants in the extreme North, but can be grown with success over most of the remaining country, and if frost-proof storage space can be given they can be maintained even in the North.

In the amateur's garden chrysanthemums require very simple treatment and yield large displays of flowers. Their range of color and form is wide and permits the gratification of personal taste in their selection.

Although chrysanthemums may be grown from seed, they are usually raised from cuttings or divisions of established plants. These, like the seedlings, come to full maturity and flower profusely in a single season and, in turn, furnish material for propagation the following year.

The plants require for their best development a rich well-drained soil, an abundance of light and air, sufficient room to develop into good bushes, and annual division and replanting in newly fertilized soil.

# CHRYSANTHEMUMS FOR THE HOME

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## CONTENTS

	Page		Page
The popularity of the chrysanthemum-----	1	Culture—Continued.	
Culture-----	3	Disbudding-----	6
Preparation of the soil-----	3	Shelters-----	7
Summer pruning or stopping-----	3	Propagation-----	9
Fertilizing-----	5	Varieties-----	12
Staking-----	5	Types of blooms-----	13
		Insect enemies-----	16

## THE POPULARITY OF THE CHRYSANTHEMUM

CHRYSANTHEMUMS are one of the striking features of the autumn garden, for no other plant in bloom at that time has so great a range of color and form. Indeed, when one considers the material available to-day, it seems a far cry from the chrysanthemums which were first brought from the Far East in 1789. The history of the chrysanthemum between the arrival of the first plants and the present day records the usual difficulties attending any new introduction, but interest rarely flagged, because of the fact that the flowers quickly produced variations, both of seed and sport, so that a constantly increasing number of varieties could be disseminated. The chrysanthemum specialist soon developed and has continued until the present time both in Europe and America, where the interest is no less great than in the Orient.

The development of the chrysanthemum has been distinctly a commercial affair, in which the chief purpose has been to secure a strain of large-flowering plants with a long duration of bloom. Attending this process numberless variations of size, shape, and color have appeared (fig. 1), all of which have been perpetuated because of their value as decorations for both conservatory and garden.

For the amateur gardener the large-flowered commercial kinds are of relatively less value, unless he lives in a climate where frosts come late or not at all. There are, however, enough kinds which he can grow to more than make up for any lack of flowers of this type. In fact, there are chrysanthemums for almost all outdoor gardens, no matter where they may be, except in the extreme northern States and in the arid regions or hot wind-swept sections of the Great Plains. In most States north of the Ohio River and north of central New York only the most enduring varieties of the chrysanthemum are hardy, but the summer is long enough to permit bloom on the early-flowering sorts, which can be grown almost like bedding

plants and wintered in frost-proof frames or cellars. In all the interior States which are subject to hot, drying winds during the summer special care must be taken in locating the bed to prevent the ruin of the foliage. In the Southern States, however, the chrysanthemum finds locations best suited to it and rewards the grower with a lavish display of bloom which might well be envied farther north.

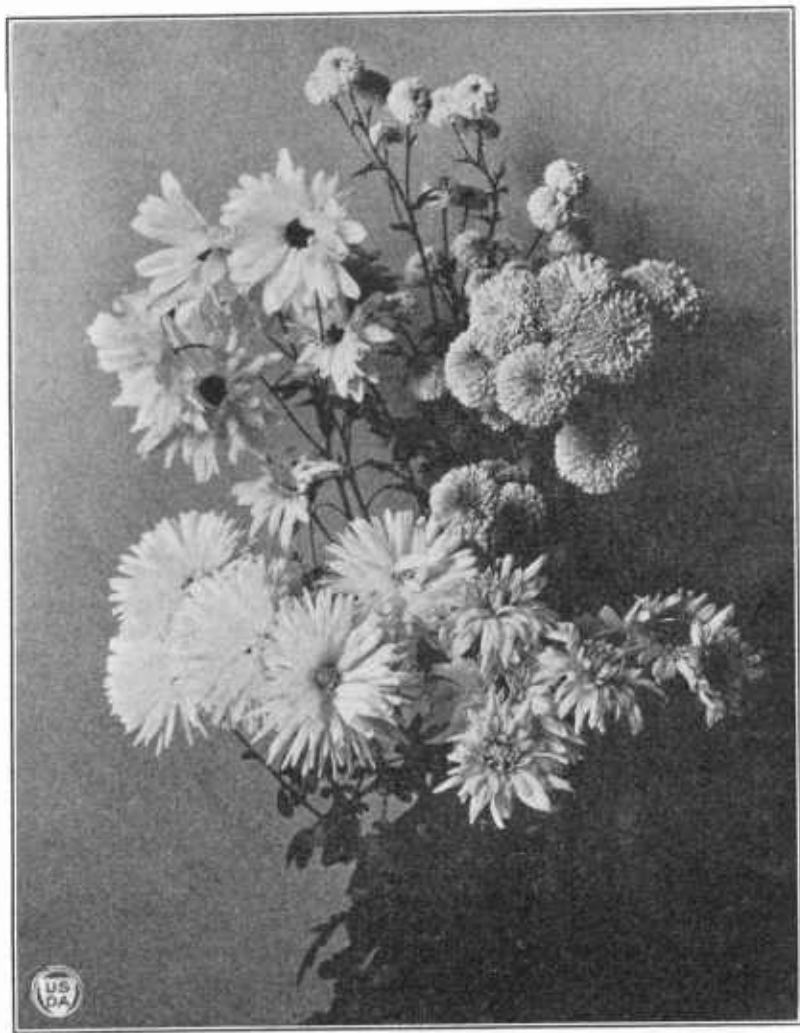


FIGURE 1.—Chrysanthemums, showing the many variations of size and shape found in the blooms

When grown at its best, the chrysanthemum is essentially a plant for the careful and painstaking gardener. Many will survive the vicissitudes of the amateur's hardy garden, but the results are far from the best. The cultural methods described in the following pages represent the better practice for the amateur, although many

gardens are known to the writer in which chrysanthemums are left year by year without more attention than is given hardy plants, such as peonies.

### CULTURE

When new garden chrysanthemums are received from the nursery they are commonly small pot-grown plants which have been raised from cuttings. (Fig. 2.) They may be divisions of old clumps, however, with new growths attached to the base of the dead stems from last year which can sometimes be divided into single shoots. In either case they are ready to be planted in the open. If they are to be located in a border of mixed perennials, the soil in which they are planted must be thoroughly enriched with well-decayed manure, because the chrysanthemum is a gross feeder, needing ample supplies to bring its flowers to perfection.

#### PREPARATION OF THE SOIL

If the plants can be given a bed to themselves or grown on the edge of the vegetable garden, the results will be even better than in a mixed border. Choose preferably a position in full sun with a soil that is light, rich, and above all, well drained, especially if the plants are to be left in the ground over winter. If the planting is a large one, an abundant supply of manure should be forked into the soil; if the bed is small, a good method is to work a shovelful of manure into the spot where each plant is to be set. The value of sufficient fertilizer can not be over-emphasized in the growth of the chrysanthemum, for it is a plant which must not be checked by lack of food or moisture in its development to flowering.

#### SUMMER PRUNING OR STOPPING

Almost as soon as the plant shows signs of becoming established in the new position, the growing tip should be removed, to induce

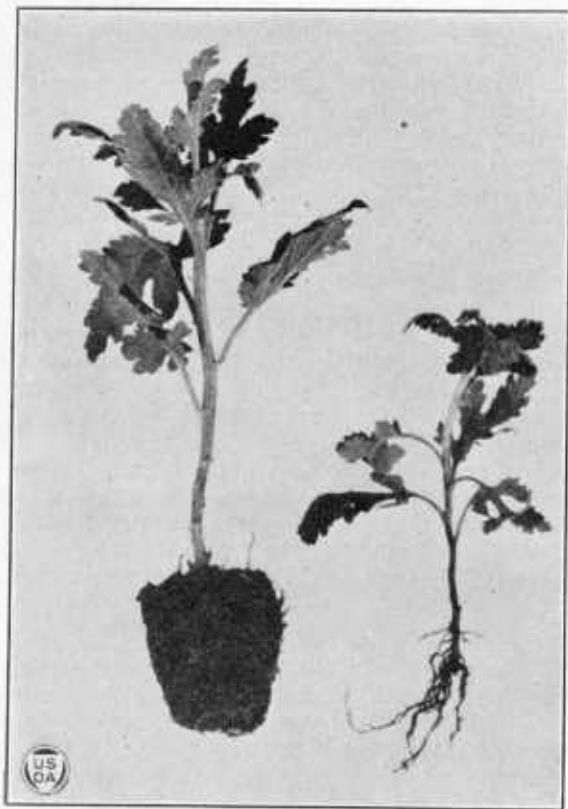


FIGURE 2.—Rooted cuttings of chrysanthemum

branching. Generally, it is advisable to pinch out the top of the shoot after three or four pairs of leaves have formed, but in the writer's garden experience even better results may be had by removing the tip after the second pair of leaves is mature. Three to five shoots will appear, which, in turn, should be stopped, to induce branching.

The importance of this can not be overestimated. Only too often the garden chrysanthemums grown in small places are great sprawling plants, almost like shrubby climbers, which yield crooked stalks for cutting. A little experience will enable one to decide the best number of stoppings for each variety, as some branch freely with one or two stoppings, while others must be checked repeatedly. No pinching out should be done after the middle of July, as this might bring the bloom too far into the autumn. Under this treatment plants will usually form broad, spreading bushes with erect, upright branches strong enough to bear the large flowers coming later.

#### FERTILIZING

From about the time of the last stopping, extra feeding can be given to advantage. As midsummer is also the time of greatest heat, extra water should be given if the soil is at all likely to dry out, and the surface should be thoroughly hoed, to insure a thick mulch. The extra feeding is commonly given in liquid form, alternating liquid manure, solutions of nitrate of soda, and sulphate of ammonia. In applying these, it is better to give copious supplies of dilute fertilizer once a week rather than smaller amounts more frequently. The soil should be watered before the fertilizers are applied. This extra feeding is often omitted for the garden varieties, but usually is more than worth the trouble. In any case it should be stopped by the time the color commences to show in the flower buds.

#### STAKING

The period of midsummer growth is especially important after the last stopping of growth has been made, for it is during this time that stakes should be driven beside those plants which grow so tall that their stems will not support them. A safe generalization would be that stakes will be needed for all the upright kinds, like the familiar Lillian Doty, which, in spite of all stopping, will give tall, unbranched stems after midsummer. A stake early in the summer will insure the erect growth of the flowering shoots, an item of no small importance when the blooms are cut.

In the latter portion of the summer, chiefly after mid-August, the plants begin their preparations for bloom. The types of buds produced by chrysanthemums and their influence on the resulting bloom have been much studied by commercial growers. The smaller flowered sorts are less affected, but as some of the large-flowered varieties can be grown successfully in the garden, a description of these buds is necessary.

#### DISBUDDING

The first bud produced by a chrysanthemum is called a "crown" bud. On the large-flowered varieties this is the bud which usually will produce the largest bloom. Almost as soon as it appears, branches

grow from the axils of the topmost leaves. If the crown bud is to be saved, these must be removed at once. The branches on the plants photographed and reproduced as Figure 3 were allowed to grow too long before removal, to illustrate more clearly their relation to the crown bud. When they are removed, all the strength of the plant rises to the crown bud, giving it a great development. If it is not



FIGURE 3.—Development of the crown bud: A, Crown bud, with secondary shoots formed; B, the same, with side shoots removed; C, the same, with three weeks' growth; D, later development of crown bud in another variety, showing the long leafless neck below the bud

to be saved, and indeed in most of the garden varieties known to the writer it is often abortive, the shoots near it should remain. If a single flower is wanted, save but one; if many flowers are wanted, all should be kept. Each will develop and produce terminal buds in clusters of from three to six or seven. If the strongest one of these is saved, it will produce a large flower, but for garden decoration



more should be saved, producing what the florists call "sprays" of bloom. (Fig. 4.)

The desirability of disbudding varieties of hardy chrysanthemums is largely a matter of personal taste. The writer prefers not to disbud any of the outdoor plants except some of the early-flowering commercial varieties of Chinese and Japanese sorts and members of the groups known in the trade as decorative and early-flowering chrysanthemums. The former are greatly helped by disbudding, and the latter produce moderate-sized flowers of great beauty, both in the garden and for cutting. Of the first type may be mentioned

Pacific Supreme, Unaka, Chrysolora, and October Frost, all of which are hardy in Washington, D. C., and of the latter the beautiful Souree d'Or, Tints of Gold, and Mrs. Harrison Craig.



FIGURE 4.—A cluster of terminal buds

#### SHELTERS

By the time of flowering the season will have advanced until there is danger of frost. Chrysanthemum plants are quite frost hardy, but the half-open flowers, especially of white and pink varieties, are badly damaged. A certain amount of danger can be overcome by choosing portions of the garden where frosts do the least damage—i. e., where the cold air does not settle. Experience will show which varieties are most susceptible and which bloom before the first frost and between that time

and the later frosts. The matter of artificial protection each person must decide for himself. Unquestionably it requires considerable labor to prepare temporary shelter of any kind. Most commonly a frame is built over the bed on which hotbed sash can be laid for roofing and the sides covered with burlap or similar material. It is to be hoped that in time a strain of early-flowering plants will be found. Those who are willing to make shelters for varieties which bloom too late to escape frosts have devised various temporary shelters of cloth or sash which give fairly adequate protection.

If the plants are grown in the ground, a tent or houselike shelter is built over the bed at such a height as to clear the stems. It should be made strong enough to carry the weight of the covering, and the framework should have the roof supports spaced sufficiently close together to prevent the covering cloth from sagging when wet by rain. In the far South this covering is often a firmly woven cheese-cloth or muslin, but farther north it is usually of some heavier material. Whatever the material and however carefully the framework is constructed, this type of shelter is open to some criticism, in that dust and soot gather on the cloth and are worked through when it rains, spoiling the flowers beneath. This difficulty is removed if the cloth on the roofs of these shelters can be replaced by coldframe sash with cloth sides which are rolled up during the day.

Sometimes it is possible to provide awning-like shelters of cloth from the side of a building. These, of course, are rarely beautiful, and the plants beneath become rather one-sided, as the light does not reach them from all sides.

A thoroughly satisfactory method sometimes used for small collections is to grow the plants in pots set in the open until danger of frost occurs. These pots are then set in a coldframe reserved for them in which the sash has been raised on corner supports sufficiently high to admit the chrysanthemums. As the colder weather sets in, side curtains of burlap are added. After flowering the stalks are cut, the corner posts removed, and the roots wintered in the coldframe.

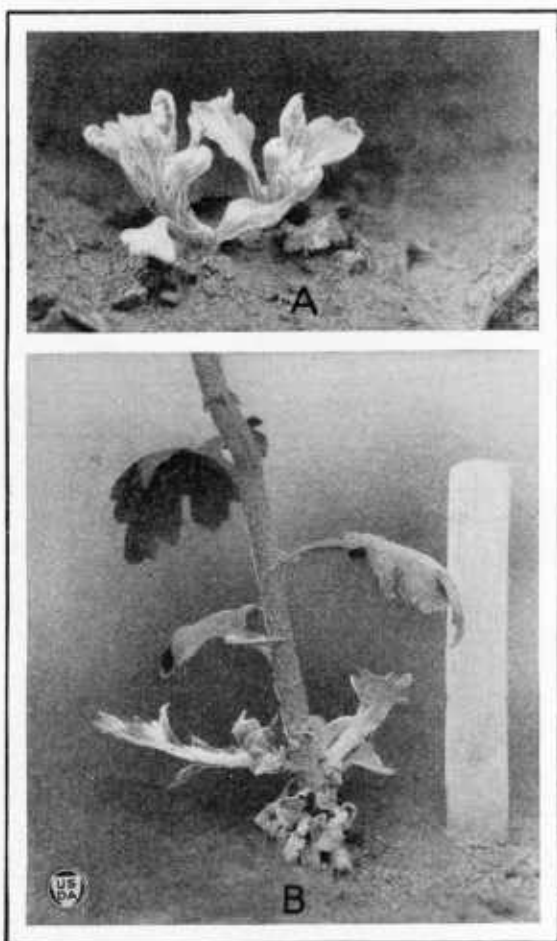


FIGURE 5.—Propagating material: A, Good shoots arising from below the ground; B, poor shoots arising from the woody stem

## PROPAGATION

In the garden, after the flowers are past, the stalks should be cut down and either one of two procedures followed. If the garden soil is not warm and thoroughly well drained the plants should be lifted and stored closely together in a cold but frost-proof frame; but if the soil is thoroughly drained they can well be left in place until spring.

The commercial grower of plants for sale commonly chooses the former method and brings his plants into a cool house in December or January to start them into growth. The little shoots (fig. 5) which form about the crown of the plant, both from underground shoots and from the old stalks, are cut off, rooted in sand, and potted off in soil, to spend the intervening months in a cool house till time for outdoor work.

The home gardener should wait till natural growth starts in the spring. Nearly all the varieties grown by the writer have suckered freely about the base, so that the clump can be lifted with a digging

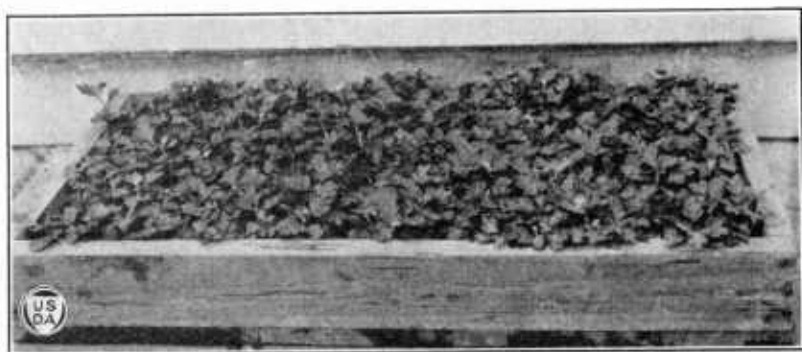


FIGURE 6.—Young chrysanthemum plants grown from seed

fork and torn into as many pieces as there are shoots. Some of these will have roots attached, but all will form roots if replanted separately in sandy soil and watered carefully for a time; in fact, it is better to cut off the end of the shoot just below the leaves and root it as a cutting in sand. This will make a plant more firmly rooted than if the underground stem had been kept. Furthermore, new shoots will arise from the cut which, in turn, can be removed to make more plants. Caution should be used in selecting cuttings, for while those from the more woody shoots of the old flower stalks root, as do the others, they do not develop into as good plants, though occasionally this disadvantage is offset by the fact that the resulting plants come into earlier bloom. When this bloom is over, the year's cycle of chrysanthemum culture has been completed and is begun again.

Seed of various types of perennial chrysanthemums is offered by nearly all dealers. This should be sown indoors in carefully prepared soil about six weeks before the last frost. The seeds germinate freely and should be grown without check in a cool temperature to prevent damping-off and to induce sturdy growth. The individual plants should be potted as soon as possible and planted out when the weather permits. Figure 6 shows a box of small seedlings. If carefully

grown, seedlings should flower the first year from seed, but a second season will be needed to determine their full value.

Occasionally self-sown seedlings appear in the garden clumps. As they rarely come true to color, their appearance can usually be detected at once. They should be removed immediately and destroyed if of undesirable color. It is the appearance of such seedlings that

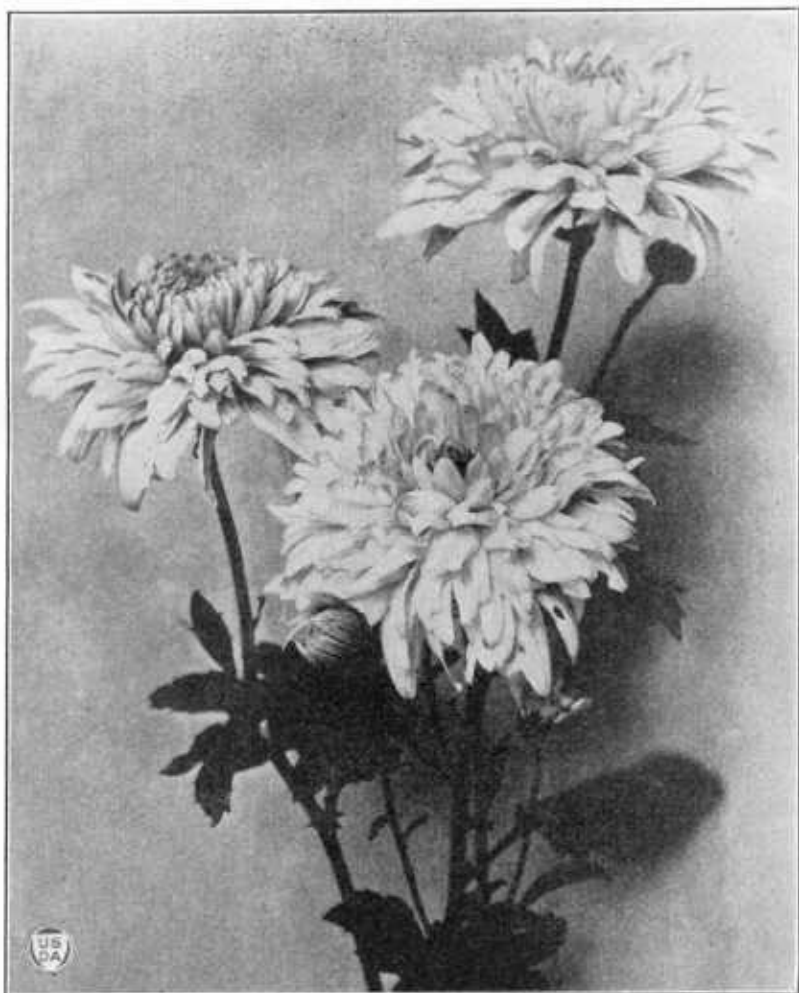


FIGURE 7.—Pacific Supreme, an exhibition variety of chrysanthemum, partially disbudded and grown in the garden

leads to the stories of chrysanthemums reverting which are sometimes heard. If these seedlings are not removed, they often succeed by their great vigor in crowding out the original plants.

#### VARIETIES

The choice of varieties for the garden is a difficult matter, because each person has a personal preference to be considered. In addition,

the chrysanthemum, having become a flower of the specialist, is exhibited in dozens of new forms each year, some of which survive the test of distribution, while others are dropped after one season, thus making the chosen list of any date more or less useless after a very few seasons.

#### TYPES OF BLOOMS

Certain types of blooms should be known to all growers and gardeners, the final choice of varieties from these being safely left to the individual.



FIGURE 8.—Irma, a decorative type of chrysanthemum

The large-flowering varieties which came originally from China and Japan do not figure extensively in the hardy garden, except in the extreme South. From Washington, D. C., southward some of the earliest of the commercial sorts can be raised out of doors. In looking through the growers' lists, note the dates of flowering, and for the Northern and Middle States choose the varieties which mature by or before the middle of October. In the South proportionately later flowering varieties will be satisfactory. These, with some shelter for the blooms, can be flowered to a very considerable degree

of perfection. In all the classes of chrysanthemums the colors range from white through lemon yellow to orange, bronze to chestnut reds, and from white through flesh and rose to deep amaranth reds and purples. Often there are combinations of two colors in one flower, as in Earl Kitchener, amaranth with a silver-pink reverse, or



FIGURE 9.—Garza, an anemone-flowered chrysanthemum

Mrs. Ernest Wild, chestnut red with bronze reverse. The shapes of these flowers also show great variety, from the incurved forms, in which every petal folds regularly inward, through the reflexed varieties, with petals falling away from the center, to Japanese forms in which the petals twist about in various fantastic ways.

The early-flowering and decorative varieties (figs. 7 and 8) are not so much grown by amateur gardeners as they well might be. They flower as freely as the pompon varieties and produce blooms of considerable size and a delightful range of shapes and colors. The accompanying illustrations show better than words the sorts of flowers to be had.

With the early-flowering sorts should be grown some of the anemone-flowered varieties. (Fig. 9.) They are delightful chrysanthem-



FIGURE 10.—Spray of single chrysanthemums

mums, much like single or semidouble ones, except that the florets of the yellow disks have lost their color and develop a more petal-like substance. All are likely to be rather late flowering and should be given a sheltered location.

The single varieties (fig. 10) have come into a tardy popularity, possibly because they do not stand shipment as well as some others and consequently have not attracted commercial attention. They are, however, beautiful flowers for the home gardener and in the

opinion of the writer are the very best sorts for cut flowers for the home as well as for garden decorations. Their number is legion, and the variations of color, form, and degree of singleness are so many that an extensive collection might well include only single sorts.

The pompon chrysanthemums (figs. 11 to 14) have two marked extremes of form—the so-called aster-flowered types, such as Mrs. Francis Bergen, and the little buttonlike forms, such as Baby or



FIGURE 11.—Virginia Seymour, a large-flowered pompon

Nio. The gradation between the two is very gradual, and many forms appear. Personally, the writer prefers the smaller flowered forms, like Nio, Golden Climax, Julie Lagravere, and Queen of the Whites, to other forms. Some of the larger aster-flowered types respond to disbudding, but unless they are of a rather flat type of flower, like the Lucifer, the resulting bloom is too fat and puffy to suit some tastes. This is especially true of the popular Lillian Doty and its white counterpart.



## INSECT ENEMIES

No discussion is included in these pages of the insect enemies affecting the chrysanthemums, since they are fully treated in Farmers' Bulletin 1306, *Insect Enemies of Chrysanthemums*. The reme-



FIGURE 12.—A pompon intermediate between the pompons and the aster-flowered types of chrysanthemum

dies described in it are those best suited for use in the home garden.

By way of emphasis, however, it may be noted that the aphid in its several forms, black, green, and red, finds the chrysanthemum a

favorite feeding place, and the careful gardener must be constantly prepared to apply contact insecticides to prevent the aphids from multiplying to such numbers that the plants are checked in their development. Two thorough applications will check each attack, one killing the larger part of the infestation and the second catching any which escaped the first application.



FIGURE 13.—An old-fashioned pompon

The aphids may often be knocked off by a strong stream of water from a hose where available, and this treatment, frequently given, is often all that is necessary to keep them in check. An abundance of ants on the plants is always suggestive of the presence of aphids.

Forty per cent nicotine sulphate, a liquid procurable in most seed stores under various proprietary names, diluted with about 1,000

parts of water in which a little fish-oil soap or good laundry soap has been previously dissolved, is now recognized as the most efficient aphid remedy. For small quantities, add 1 teaspoonful of the nicotine to each 1 or 2 gallons of water in which about one-half an ounce of soap has been dissolved.

Pyrethrum, known also as buhach or Persian insect powder, may be dusted on or may be used with water at the rate of 1 ounce to 2 quarts. This is much more effective when fresh.

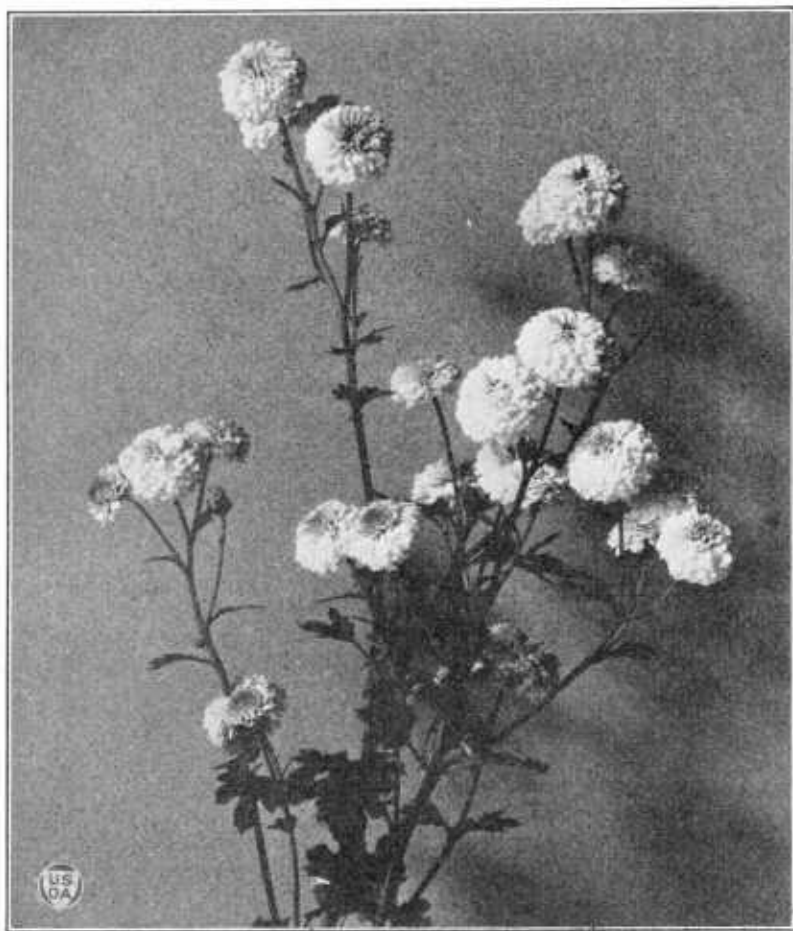


FIGURE 14.—Nio, a button-flowered pompon

Fish-oil soap may be dissolved at the rate of one-fourth of a pound to 8 quarts of water. It dissolves most quickly in hot water. A small quantity of hot water may be used first and then the solution diluted to the quantity mentioned. It should be cooled before it is applied.

Kerosene emulsion may be prepared as follows: Dissolve 1 ounce of good laundry soap in 1 pint of hot water; remove from the fire,

add 1 quart of kerosene, and beat until a creamy mixture is formed, from which the oil does not separate, but which becomes semisolid on cooling. To pump it back into itself by means of the spray pump is an efficient method of emulsifying the mixture. This emulsion should be reasonably permanent and may be kept as a stock solution. For applying, use 1 pint of the stock solution to 10 quarts of water.

There are also on the market various other dusts or powders that are satisfactory when thoroughly applied. Tobacco dust and the pyrethrum mentioned are two of the older forms.

Commercially prepared insecticides should be used according to the directions accompanying them. Many good brands are on the market.

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